

What is claimed is:

1. A method for diagnosing or aiding in the diagnosis of a vascular disease or disorder in a subject comprising the steps of determining the PLCG1 and PAI-2 genetic profile of the subject, thereby diagnosing or aiding in the diagnosis of a vascular disease or disorder.
2. The method of claim 1, wherein determining the subject's PLCG1 and PAI-2 genetic profile comprises determining the identity of the nucleotide present at nucleotide position 64001 of SEQ ID NO:1 and the nucleotide present at nucleotide position 170871 of SEQ ID NO:3, or the complement thereof.
3. The method of claim 1, wherein determining the subject's PLCG1 and PAI-2 genetic profile comprises determining the identity of the amino acid present at amino acid residue 813 of SEQ ID NO:2 and the amino acid present at amino acid residue 120 of SEQ ID NO:4, or the complement thereof.
4. The method of claim 1, wherein the vascular disease is myocardial infarction.
5. The method of claim 1, wherein the vascular disease is coronary artery disease.
6. A method for predicting the likelihood that a subject will or will not develop a vascular disease or disorder comprising the steps of determining the PLCG1 and PAI-2 genetic profile of the subject, thereby predicting the likelihood that a subject will or will not develop a vascular disease or disorder.

7. The method of claim 6, wherein determining the subject's PLCG1 and PAI-2 genetic profile comprises determining the identity of the nucleotide present at nucleotide position 64001 of SEQ ID NO:1 and the nucleotide present at nucleotide position 170871 of SEQ ID NO:3, or the complement thereof.

5

8. The method of claim 6, wherein determining the subject's PLCG1 and PAI-2 genetic profile comprises determining the identity of the amino acid present at amino acid residue 813 of SEQ ID NO:2 and/or the amino acid present at amino acid residue 120 of SEQ ID NO:4, or the complement thereof.

10

9. The method of claim 6, wherein the vascular disease is myocardial infarction.

10. The method of claim 6, wherein the vascular disease is coronary artery disease.

15

11. A method of diagnosing or aiding in the diagnosis of a vascular disease in a subject comprising the steps of determining the nucleotide present at nucleotide position 170871 of the PAI-2 gene and determining the nucleotide present at nucleotide position 64001 of the PLCG1 gene, wherein the presence of two copies of a thymidine allele at nucleotide position 170871 of the PAI-2 gene together with two copies of a thymidine allele at nucleotide position 64001 of the PLCG1 gene, or the complements thereof, is indicative of decreased likelihood of a vascular disease in the subject as compared with a subject having any other combination of these alleles.

20

12. The method of claim 11, wherein determining said nucleotides comprises obtaining a nucleic acid sample from the subject.

25

13. The method of claim 11, wherein the PLCG1 gene has the nucleotide sequence of SEQ ID NO:1, or a portion thereof, and wherein the PAI-2 gene has the nucleotide sequence of SEQ ID NO:3, or a portion thereof.

5 14. The method of claim 11, wherein the vascular disease is selected from the group consisting of atherosclerosis, coronary artery disease, myocardial infarction, ischemia, stroke, peripheral vascular diseases, venous thromboembolism and pulmonary embolism.

10 15. The method of claim 14, wherein the vascular disease is myocardial infarction.

16. The method of claim 14, wherein the vascular disease is coronary artery disease.

15 17. A method for predicting the likelihood that a subject will or will not develop a vascular disease, comprising the steps of determining the nucleotide present at nucleotide position 170871 of the PAI-2 gene and determining the nucleotide present at nucleotide position 64001 of the PLCG1 gene, wherein the presence of two thymidine alleles at nucleotide position 170871 of the PAI-2 gene and the presence of two thymidine alleles at  
20 nucleotide position 64001 of the PLCG1 gene, or the complements thereof, is indicative of decreased likelihood of the subject developing a vascular disease as compared with a subject having any other combination of these alleles.

25 18. The method of claim 17, wherein determining said nucleotides comprises obtaining a nucleic acid sample from the subject.

19. The method of claim 17, wherein the PLCG1 gene has the nucleotide sequence of SEQ ID NO:1, or a portion thereof, and wherein the PAI-2 gene has the nucleotide sequence of SEQ ID NO:3, or a portion thereof.

20. The method of claim 17, wherein the vascular disease is selected from the group consisting of atherosclerosis, coronary artery disease, myocardial infarction, ischemia, stroke, peripheral vascular diseases, venous thromboembolism and pulmonary embolism.

5

21. The method of claim 20, wherein the vascular disease is myocardial infarction.

22. The method of claim 21, wherein the vascular disease is coronary artery disease.

10

23. A method of diagnosing or aiding in the diagnosis of a vascular disease in a subject comprising the steps of determining the amino acid present at amino acid position 120 of the PAI-2 protein and determining the amino acid present at amino acid position 813 of the PLCG1 protein, wherein presence of a threonine at amino acid position 813 of the PLCG1 protein and the presence of an asparagine at amino acid position 120 of the PAI-2 protein is indicative of decreased likelihood of a vascular disease in the subject as compared with a subject having any other combination of these amino acids.

15

24. The method of claim 23, wherein determining said amino acids comprises obtaining a protein sample from the subject.

20

25. The method of claim 23, wherein the PLCG1 protein has the amino acid sequence of SEQ ID NO:2, or a portion thereof and wherein the PAI-2 protein has the amino acid sequence of SEQ ID NO:4, or a portion thereof.

25

26. The method of claim 23, wherein the vascular disease is selected from the group consisting of atherosclerosis, coronary artery disease, myocardial infarction, ischemia, stroke, peripheral vascular diseases, venous thromboembolism and pulmonary embolism.

27. The method of claim 25, wherein the vascular disease is myocardial infarction.

5 28. The method of claim 25, wherein the vascular disease is coronary artery disease.

29. A method for predicting the likelihood that a subject will not develop a vascular disease, comprising the steps of determining the amino acid present at amino acid  
10 position 120 of the PAI-2 protein and determining the amino acid present at amino acid position 813 of the PLCG1 protein, wherein presence of a threonine at amino acid position 813 of the PLCG1 protein and the presence of an asparagine at amino acid position 120 of the PAI-2 protein is indicative of decreased likelihood of a subject developing a vascular disease as compared with a subject having any other combination of these amino acids.

15

30. The method of claim 29, wherein determining said amino acids comprises obtaining a protein sample from the subject.

20 31. The method of claim 29, wherein the PLCG1 protein has the amino acid sequence of SEQ ID NO:2, or a portion thereof and wherein the PAI-2 protein has the amino acid sequence of SEQ ID NO:4, or a portion thereof.

32. The method of claim 29, wherein the vascular disease is selected from the  
25 group consisting of atherosclerosis, coronary artery disease, myocardial infarction, ischemia, stroke, peripheral vascular diseases, venous thromboembolism and pulmonary embolism.

33. The method of claim 29, wherein the vascular disease is myocardial infarction.

34. The method of claim 32, wherein the vascular disease is coronary artery disease.

5           35. A computer readable medium for storing instructions for performing a computer implemented method for determining whether or not a subject has a predisposition to a vascular disease or disorder, said instructions comprising the functionality of:  
obtaining information from the subject indicative of the presence or absence of the polymorphic region of a PLCG1 and/or PAI-2 gene, and  
10           based on the presence or absence of the polymorphic region of a PLCG1 and/or PAI-2 gene, determining whether or not the subject has a predisposition to a vascular disease or disorder.

15           36. A computer readable medium for storing instructions for performing a computer implemented method for identifying a predisposition to a vascular disease or disorder, said instructions comprising the functionality of:  
obtaining information regarding the presence or absence of the polymorphic region of a PLCG1 and/or PAI-2 gene, and  
based on the presence or absence of the polymorphic region of a PLCG1 and/or PAI-  
20           2 gene, identifying a predisposition to a vascular disease or disorder.

25           37. An electronic system comprising a processor for determining whether or not a subject has a predisposition to a vascular disease or disorder, said processor implementing the functionality of:  
obtaining information from the subject indicative of the presence or absence of the polymorphic region of a PLCG1 and/or PAI-2 gene, and  
based on the presence or absence of the polymorphic region of a PLCG1 and/or PAI-2 gene, determining whether or not the subject has the predisposition to a vascular disease or disorder.

38. An electronic system comprising a processor for performing a method for identifying a predisposition to a vascular disease or disorder in a subject, said processor implementing the functionality of:

5 obtaining information from the subject indicative of the presence or absence of the polymorphic region of a PLCG1 and/or PAI-2 gene, and

based on the presence or absence of the polymorphic region of a PLCG1 and/or PAI-2 gene, performing a method for identifying a predisposition to a vascular disease or disorder associated with the polymorphic region.

10

39. The electronic system of claims 37 or 38, wherein said processor further implements the functionality of receiving phenotypic information associated with the subject.

40. The electronic system of claims 37 or 38, wherein said processor further  
15 implements the functionality of acquiring from a network phenotypic information associated with the subject.

41. A network system for identifying a predisposition to a vascular disease or disorder in response to information submitted by an individual, said system comprising  
20 means for:

receiving data from the individual regarding the presence or absence of the polymorphic region of a PLCG1 and/or PAI-2 gene, and

based on the presence or absence of the polymorphic region, determining whether or not the subject has the predisposition to the vascular disease or disorder associated with the  
25 polymorphic region.

42. A network system for identifying whether or not a subject has a predisposition to a vascular disease or disorder, said system comprising means for:

receiving information from the subject regarding the polymorphic region of a PLCG1 and/or PAI-2 gene,

receiving phenotypic information associated with the subject,

acquiring additional information from the network, and

- 5 based on one or more of the phenotypic information, the polymorphic region, and the acquired information, determining whether or not the subject has a pre-disposition to a vascular disease or disorder associated with a polymorphic region of a PLCG1 and/or PAI-2 gene.

- 10 43. The system of claims 41 and 42, wherein the network system comprises a server and a work station operatively connected to said server via the network.

- 15 44. A composition comprising an isolated nucleic acid molecule comprising an allelic variant of a polymorphic region of a PLCG1 gene, wherein the allelic variant differs from the reference sequence set forth in SEQ ID NO:1, or a portion thereof, and wherein the allelic variant is associated with aberrant PLCG1 activity, in combination with an isolated nucleic acid molecule comprising an allelic variant of a polymorphic region of a PAI-2 gene, wherein the allelic variant does not differ from the reference sequence set forth in SEQ ID NO:3, or a portion thereof, and wherein the allelic variant is associated with aberrant PAI-2  
20 activity.

45. The composition of claim 44, wherein the polymorphic regions are located in an exon.

- 25 46. A composition comprising an isolated nucleic acid molecule comprising the nucleotide sequence of SEQ ID NO:1, or a portion thereof, further comprising the nucleotide sequence of SEQ ID NO:5, or the complement thereof, in combination with an isolated nucleic acid molecule comprising the nucleotide sequence of SEQ ID NO:3, or a portion thereof, further comprising the nucleotide sequences of SEQ ID NO:6, or the complement



thereof.

47. A composition comprising an isolated nucleic acid molecule comprising the nucleotide sequence set forth in SEQ ID NO:1, or a portion thereof, wherein residue 64001 is a thymidine, or the complement thereof, in combination with an isolated nucleic acid molecule comprising the nucleotide sequence set forth in SEQ ID NO:3, or a portion thereof, wherein residue 170871 is a thymidine, or the complement thereof.

48. A kit comprising probes or primers which are capable of hybridizing to the nucleic acid molecules of any of claims 44-47.

49. The kit of claim 48, wherein the probes or primers comprise a nucleotide sequence from about 15 to about 30 nucleotides.

50. The kit of claim 48, wherein the probes or primers are labeled.

51. A method for determining the identity of one or more allelic variants of a polymorphic region of a PLCG1 gene and a PAI-2 gene in a nucleic acid obtained from a subject, comprising contacting a sample nucleic acid from the subject with a probe or primer having a sequence which is complementary to a PLCG1 gene sequence and a probe or primer which is complementary to a PAI-2 gene sequence, wherein the sample comprises a PLCG1 gene sequence and a PAI-2 gene sequence, thereby determining the identity of one or more of the allelic variants.

52. The method of claim 51, wherein the probes or primers are capable of hybridizing to an allelic variant of a polymorphic region of the PLGC1 and PAI-2 genes, and wherein the allelic variant differs from the reference sequence set forth in of SEQ ID NO:1 and does not differ from the reference sequence set forth in SEQ ID NO:3.

53. The method of claim 52, wherein determining the identity of the allelic variant comprises determining the identity of at least one nucleotide of the polymorphic region of a PLCG1 gene and at least one nucleotide of the polymorphic region of a PAI-2 gene.

5

54. The method of claim 53, wherein determining the identity of the allelic variant consists of determining the nucleotide content of the polymorphic region.

55. The method of claim 53, wherein determining the nucleotide content  
10 comprises sequencing the nucleotide sequence.

56. The method of claim 53, wherein determining the identity of the allelic variant comprises performing a restriction enzyme site analysis.

57. The method of claim 53, wherein determining the identity of the allelic  
15 variant is carried out by single-stranded conformation polymorphism.

58. The method of claim 53, wherein determining the identity of the allelic variant is carried out by allele specific hybridization.

20

59. The method of claim 53, wherein determining the identity of the allelic variant is carried out by primer specific extension.

60. The method of claim 53, wherein determining the identity of the allelic  
25 variant is carried out by an oligonucleotide ligation assay.

61. The method of claim 53, wherein the probe or primer comprises a nucleotide sequence from about 15 to about 30 nucleotides.

62. An Internet-based method for assessing a subject's risk for vascular disease, the method comprising:

- a) analyzing biological information from a subject indicative of the presence or absence of a polymorphic region of PLCG1 and/or PAI-2;
- 5 b) providing results of the analysis to the subject via the Internet, wherein the presence of a polymorphic region of PLCG1 and/or PAI-2 indicates a decreased risk for vascular disease.

63. A method of assessing a subject's risk for vascular disease, the method  
10 comprising:

- a) obtaining biological information from the individual;
- b) analyzing the information to obtain the subject's PLCG1 and/or PAI-2 genetic profile;
- c) representing the PLCG1 and/or PAI-2 genetic profile information as  
15 digital genetic profile data;
- d) electronically processing the PLCG1 and/or PAI-2 digital genetic profile data to generate a risk assessment report for vascular disease, wherein the presence of a polymorphic region of PLCG1 and/or PAI-2 indicates a decreased risk for vascular disease; and
- e) displaying the risk assessment report on an output device.

20

64. A method of assessing a subject's risk for vascular disease, the method comprising:

- a) obtaining the subject's PLCG1 and/or PAI-2 genetic profile information as digital genetic profile data;
- 25 b) electronically processing the PLCG1 and/or PAI-2 digital genetic profile data to generate a risk assessment report for vascular disease, wherein the presence of a polymorphic region of PLCG1 and/or PAI-2 indicates a decreased risk for vascular disease; and
- c) displaying the risk assessment report on an output device.

65. The method of claims 63 or 64, further comprising the step of using the risk assessment report to provide medical advice.

5 66. The method of claims 63 or 64, wherein additional health information is provided.

67. The method of claim 66, wherein the additional health information comprises information regarding one or more of age, sex, ethnic origin, diet, sibling health, parental health, clinical symptoms, personal health history, blood test data, weight, and alcohol use,  
10 drug use, nicotine use, and blood pressure.

68. The method of claim 64, wherein the PLCG1 and/or PAI-2 digital genetic profile data are transmitted via a communications network to a medical information system for processing.  
15

69. The method of claim 68, wherein the communications network is the Internet.

70. A medical information system for assessing a subject's risk for vascular disease comprising:

20 a) means for obtaining biological information from the individual to obtain a PLCG1 and/or PAI-2 genetic profile;

b) means for representing the PLCG1 and/or PAI-2 genetic profile as digital molecular data;

25 c) means for electronically processing the PLCG1 and/or PAI-2 digital genetic profile to generate a risk assessment report for vascular disease; and

d) means for displaying the risk assessment report on an output device, wherein the presence of a polymorphic region of PLCG1 and/or PAI-2 indicates a decreased risk for vascular disease.

71. A medical information system for assessing a subject's risk for vascular disease comprising:

a) means for representing the subject's PLCG1 and/or PAI-2 genetic profile data as digital molecular data;

5 b) means for electronically processing the PLCG1 and/or PAI-2 digital genetic profile to generate a risk assessment report for vascular disease; and

c) means for displaying the risk assessment report on an output device, wherein the presence of a polymorphic region of PLCG1 and/or PAI-2 indicates a decreased risk for vascular disease.

10

72. A computerized method of providing medical advice to a subject comprising:

a) analyzing biological information from a subject to determine the subject's PLCG1 and/or PAI-2 genetic profile;

15 b) based on the subject's PLCG1 and/or PAI-2 genetic profile, determining the subject's risk for vascular disease;

c) based on the subject's risk for vascular disease, electronically providing medical advice to the subject.

73. A computerized method of providing medical advice to a subject comprising:

20 a) based on the subject's PLCG1 and/or PAI-2 genetic profile, determining the subject's risk for vascular disease;

b) based on the subject's risk for vascular disease, electronically providing medical advice to the subject.

25 74. The method of any of claims 72 or 73, wherein the medical advice comprises one or more of the group consisting of further diagnostic evaluation, administration of medication, or lifestyle change.

75. The method of claims 72 or 73, wherein additional health information is

obtained from the subject.

76. The method of claim 75, wherein the additional health information comprises information regarding one or more of age, sex, ethnic origin, diet, sibling health, parental health, clinical symptoms, personal health history, blood test data, weight, and alcohol use, drug use, nicotine use, and blood pressure.

77. A method for self-assessing risk for a vascular disease comprising  
a) providing biological information for genetic analysis;  
b) accessing an electronic output device displaying results of the genetic analysis, thereby self-assessing risk for a vascular disease, wherein the presence of a polymorphic region of PLCG1 and/or PAI-2 indicates a decreased risk for vascular disease.

78. A method for self-assessing risk for a vascular disease comprising accessing an electronic output device displaying results of a genetic analysis of a biological sample, wherein the presence of a polymorphic region of PLCG1 and/or PAI-2 indicates a decreased risk for vascular disease, thereby self-assessing risk for a vascular disease.

79. A method of self-assessing risk for vascular disease, the method comprising  
a) providing biological information;  
b) accessing PLCG1 and/or PAI-2 digital genetic profile data obtained from the biological information, the PLCG1 and/or PAI-2 digital genetic profile data being displayed via an output device, wherein the presence of a polymorphic region of PLCG1 and/or PAI-2 indicates a decreased risk for vascular disease.

80. A method of self-assessing risk for vascular disease, the method comprising accessing PLCG1 and/or PAI-2 digital genetic profile data obtained from biological information, the PLCG1 and/or PAI-2 digital genetic profile data being displayed via an output device, wherein the presence of a polymorphic region of PLCG1 and/or PAI-2

indicates a decreased risk for vascular disease.

81. The method of claims 79 or 80, wherein the electronic output device is accessed via the Internet.

5

82. The method of claims 79 or 80, wherein additional health information is provided.

83. The method of claim 82, wherein the additional health information comprises  
10 information regarding one or more of age, sex, ethnic origin, diet, sibling health, parental health, clinical symptoms, personal health history, blood test data, weight, and alcohol use, drug use, nicotine use, and blood pressure.

84. The method of any of claims 77, 78, 79, or 80, wherein the biological  
15 information is obtained from a sample from an individual at a laboratory company.

85. The method of claim 84, wherein the laboratory company processes the biological sample to obtain PLCG1 and/or PAI-2 genetic profile data, represents at least some of the PLCG1 and/or PAI-2 genetic profile data as digital genetic profile data, and  
20 transmits the PLCG1 and/or PAI-2 digital genetic profile data via a communications network to a medical information system for processing.

86. The method of any of claims 77, 78, 79, or 80, wherein the biological information is obtained from a sample from an individual at a draw station, wherein the draw  
25 station processes the biological sample to obtain PLCG1 and/or PAI-2 genetic profile data, and transfers the data to a laboratory company.

87. The method of claim 86, wherein the laboratory company represents at least some of the PLCG1 and/or PAI-2 genetic profile data as digital genetic profile data, and

transmits the PLCG1 and/or PAI-2 digital genetic profile data via a communications network to a medical information system for processing.

88. A method for a health care provider to generate a personal health assessment  
5 report for an individual, the method comprising counseling the individual to provide a  
biological sample; authorizing a draw station to take a biological sample from the individual  
and transmit molecular information from the sample to a laboratory company, wherein the  
molecular information comprises the presence or absence of a polymorphic region of PLCG1  
and/or PAI-2; requesting the laboratory company to provide digital molecular data  
10 corresponding to the molecular information to a medical information system to electronically  
process the digital molecular data and digital health data obtained from the individual to  
generate a health assessment report; receiving the health assessment report from the medical  
information system; and providing the health assessment report to the individual.

89. A method for a health care provider to generate a personal health assessment  
15 report for an individual, the method comprising requesting a laboratory company to provide  
digital molecular data corresponding to the molecular information derived from a biological  
sample from the individual to a medical information system to electronically process the  
digital molecular data and digital health data obtained to generate a health assessment report;  
20 receiving the health assessment report from the medical information system; and providing  
the health assessment report to the individual.

90. A method of assessing the health of an individual, the method comprising:  
obtaining health information from the individual using an input device; representing at least  
25 some of the health information as digital health data; obtaining biological information from  
the individual, wherein the information comprises the presence or absence of a polymorphic  
region of PLCG1 and/or PAI-2; representing at least some of the information as digital  
molecular data; electronically processing the digital molecular data and digital health data to  
generate a health assessment report; and displaying the health assessment report on an output



device.

91. The method of claim 90, wherein electronically processing the digital molecular data and digital health data to generate a health assessment report comprises using  
5 the digital molecular data and digital health data as inputs for an algorithm or a rule-based system that determines whether the individual is at risk for a specific disorder.

92. The method of claim 90, wherein the individual has or is at risk of developing vascular disease, and wherein electronically processing the digital molecular data and digital  
10 health data to generate a health assessment report comprises using the digital molecular data and digital health data as inputs for an algorithm or a rule-based system that determines the individual's prognosis.

93. The method of claim 90, wherein electronically processing the digital  
15 molecular data and digital health data comprises using the digital molecular data and digital health data as inputs for an algorithm or a rule-based system based on one or more databases comprising stored digital molecular data and/or digital health data relating to one or more disorders.

20 94. The method of claim 90, wherein electronically processing the digital molecular data and digital health data comprises using the digital molecular data and digital health data as inputs for an algorithm or a rule-based system based on one or more databases comprising (i) stored digital molecular data and/or digital health data from a plurality of healthy individuals, and (ii) stored digital molecular data and/or digital health data from one  
25 or more pluralities of unhealthy individuals, each plurality of individuals having a specific disorder.

95. The method of either of claims 93 or 94, wherein at least one of the databases is a public database.

96. The method of claim 90, wherein the digital health data and digital molecular data are transmitted via a communications network to a medical information system for processing.

5

97. The method of claim 95, wherein the communications network is the Internet.

98. The method of claim 95, wherein the input device is a keyboard, touch screen, hand-held device, telephone, wireless input device, or interactive page on a website.

10

99. The method of claim 90, wherein the health assessment report comprises a digital molecular profile of the individual.

100. The method of claim 90, wherein the health assessment report comprises a digital health profile of the individual.

15

101. The method of claim 90, wherein the molecular data comprises nucleic acid sequence data, and the molecular profile comprises a genetic profile.

102. The method of claim 90, wherein the molecular data comprises protein sequence data, and the molecular profile comprises a proteomic profile.

20

103. The method of claim 90, wherein the molecular data comprises information regarding one or more of the absence, presence, or level, of one or more specific proteins, polypeptides, chemicals, cells, organisms, or compounds in the individual's biological sample.

25

104. The method of claim 90, wherein the health information comprises information relating to one or more of age, sex, ethnic origin, diet, sibling health, parental

110. The method of claim 95, wherein the health assessment report provides information about treatment options for a particular disorder.

111. The method of claim 110, wherein the treatment options comprise one or more of diet, one or more drugs, physical therapy, and surgery.

5 112. The method of claim 95, wherein the health assessment report provides information about the efficacy of a particular treatment regimen and options for therapy adjustment.

10 113. The method of claim 95, further comprising storing the molecular data.

114. The method of claim 113, further comprising building a database of stored molecular data from a plurality of individuals.

15 115. The method of claim 95, further comprising storing the molecular data and health data.

116. The method of claim 115, further comprising building a database of stored molecular data and health data from a plurality of individuals.

20 117. The method of claim 116, further comprising building a database of stored digital molecular data and/or digital health data from a plurality of healthy individuals, and stored digital molecular data and/or digital health data from one or more pluralities of unhealthy individuals, each plurality of individuals having a specific disorder.

25